United Nations

FCCC/ARR/2017/RUS

Framework Convention on Climate Change

Distr.: General
4 May 2018

English only

Report on the individual review of the annual submission of the Russian Federation submitted in 2017*

Note by the expert review team

Summary

Each Party included in Annex I to the Convention must submit an annual greenhouse gas (GHG) inventory covering emissions and removals of GHG emissions for all years from the base year (or period) to two years before the inventory due date (decision 24/CP.19). Parties included in Annex I to the Convention that are Parties to the Kyoto Protocol are also required to report supplementary information under Article 7, paragraph 1, of the Kyoto Protocol with the inventory submission due under the Convention. This report presents the results of the individual inventory review of the 2017 annual submission of the Russian Federation, conducted by an expert review team in accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol". The review took place from 11 to 16 September 2017 in Bonn, Germany.

* In the symbol for this document, 2017 refers to the year in which the inventory was submitted, not to the year of publication.

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Contents

		Paragraphs	*Page*
	Abbreviations and acronyms		3
I.	Introduction	1–4	5
II.	Summary and general assessment of the 2017 annual submission	5	6
III.	Status of implementation of issues and/or problems raised in the previous review report	6	8
IV.	Issues identified in three successive reviews and not addressed by the Party	7	16
V.	Additional findings made during the 2017 individual inventory review	8	17
VI.	Application of adjustments	9	32
VII.	Accounting quantities for activities under Article 3, paragraph 3, and, if any, activities under Article 3, paragraph 4, of the Kyoto Protocol	10	32
VIII.	Questions of implementation	11	32
Annexes			
I.	Overview of greenhouse gas emissions and removals for the Russian Federation for submission year 2017 and data and information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as submitted by the Russian Federation		33
II.	Additional information to support findings in table 2		37
III.	Documents and information used during the review		38

Abbreviations and acronyms

2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*
AAU	assigned amount unit
AD	activity data
AR	afforestation and reforestation
Article 8 review guidelines	"Guidelines for review under Article 8 of the Kyoto Protocol"
CaO	calcium oxide
CER	certified emission reduction
CF_4	tetrafluoromethane
C_2F_6	hexafluoroethane
C_3F_8	perfluoropropane
c-C_4F_8	octafluorocyclobutane
CH_4	methane
CM	cropland management
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CPR	commitment period reserve
CRF	common reporting format
DE	digestible energy
DOC	degradable organic carbon
DOCf	fraction of degradable organic carbon that decomposes
EF	emission factor
ERT	expert review team
ERU	emission reduction unit
FAO	Food and Agriculture Organization of the United Nations
FM	forest management
FMRL	forest management reference level
GHG	greenhouse gas
GM	grazing land management
HFCs	hydrofluorocarbons
IE	included elsewhere
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
JI	joint implementation
KP-LULUCF activities	LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol
Kyoto Protocol Supplement	*2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*
LULUCF	land use, land-use change and forestry
MCF	methane correction factor
N	nitrogen
NA	not applicable
NE	not estimated
NEU	non-energy use
Nex	nitrogen excretion rate
NF_3	nitrogen trifluoride

NIR	national inventory report
NO	not occurring
N_2O	nitrous oxide
PFCs	perfluorocarbons
QA/QC	quality assurance/quality control
RMU	removal unit
RV	revegetation
SEF	standard electronic format
SF_6	sulfur hexafluoride
SIAR	standard independent assessment report
SWDS	solid waste disposal site
UNFCCC	United Nations Framework Convention on Climate Change
UNFCCC Annex I inventory reporting guidelines	"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories"
UNFCCC review guidelines	"Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention"
WDR	wetland drainage and rewetting
Wetlands Supplement	*2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*

I. Introduction[1]

1. This report covers the review of the 2017 annual submission of the Russian Federation organized by the secretariat, in accordance with the Article 8 review guidelines (decision 22/CMP.1, as revised by decision 4/CMP.11). In accordance with the Article 8 review guidelines, this review process also encompasses the review under the Convention as described in the UNFCCC review guidelines, particularly in part III thereof, namely the "UNFCCC guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention" (decision 13/CP.20). The review took place from 11 to 16 September 2017 in Bonn, Germany, and was coordinated by Ms. Claudia do Valle, Mr. Nalin Srivastava and Ms. Karen Ortega (secretariat). Table 1 provides information on the composition of the ERT that conducted the review of the Russian Federation.

Table 1
Composition of the expert review team that conducted the review of the Russian Federation

Area of expertise	*Name*	*Party*
Generalist	Ms. Batima Punsalmaa	Mongolia
	Ms. Regine Röthlisberger	Switzerland
Energy	Mr. Christo Christov	Bulgaria
	Ms. Renata Patricia Soares Grisoli	Brazil
	Mr. Jos Olivier	Netherlands
	Mr. Tomoki Takahashi	Japan
IPPU	Ms. Valentina Idrissova	Kazakhstan
	Ms. Eva Krtková	Czechia
	Mr. Lorenz Moosmann	Austria
	Mr. Ole-Kenneth Nielsen	Denmark
Agriculture	Mr. Abdulkadir Bektas	Turkey
	Ms. Sanaa Enkhtaivan	Mongolia
	Ms. Olga Gavrilova	Estonia
LULUCF	Mr. Kevin Black	Ireland
	Mr. Emil Cienciala	Czechia
	Mr. Nagmeldin Elhassan	Sudan
	Mr. Doru-Leonard Irimie	Romania
Waste	Mr. Richard Claxton	United Kingdom of Great Britain and Northern Ireland
	Mr. Jose Manuel Ramirez Garcia	Spain
	Ms. Violeta Hristova	Bulgaria
Lead reviewers	Ms. Idrissova	
	Mr. Nielsen	

[1] At the time of publication of this report, the Russian Federation had not yet submitted its instrument of ratification of the Doha Amendment, and the amendment had not yet entered into force. The implementation of the provisions of the Doha Amendment is therefore considered in this report in the context of decision 1/CMP.8, paragraph 6, pending the entry into force of the amendment.

2. The basis of the findings in this report is assessment by the ERT of the consistency of the Party's 2017 annual submission with the Article 8 review guidelines. The ERT has made recommendations that the Russian Federation resolve the findings related to issues,[2] including issues designated as problems.[3] Other findings, and, if applicable, the encouragements of the ERT to the Russian Federation to resolve them, are also included. The assessment by the ERT takes into account that the Russian Federation does not have a quantified emission limitation or reduction commitment for the second commitment period of the Kyoto Protocol inscribed in the third column of Annex B in the Doha Amendment to the Kyoto Protocol.

3. A draft version of this report was communicated to the Government of the Russian Federation, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

4. Annex I shows annual GHG emissions for the Russian Federation, including totals excluding and including the LULUCF sector, indirect CO_2 emissions and emissions by gas and by sector. Annex I also contains background data related to emissions and removals from KP-LULUCF activities, if elected, by gas, sector and activity for the Russian Federation.

II. Summary and general assessment of the 2017 annual submission

5. Table 2 provides the assessment by the ERT of the annual submission with respect to the tasks undertaken during the review. Further information on the issues identified, as well as additional findings, may be found in tables 3 and 5.

Table 2
Summary of review results and general assessment of the inventory of the Russian Federation

Assessment			*Issue or problem ID#(s) in table 3 and/or 5[a]*
Dates of submission	Original submission: 25 July 2017 (NIR), 14 April 2017, version 7 (CRF tables)		
	Revised submission: 25 July 2017, version 2 (CRF tables)		
	Unless otherwise specified, the values from the latest submission are used in this report		
Review format	Centralized		
Application of the requirements of the UNFCCC Annex I inventory reporting guidelines and Wetlands Supplement (if applicable)	1. Have any issues been identified in the following areas:		
	(a) Identification of key categories	No	
	(b) Selection and use of methodologies and assumptions	Yes	A.8, L.5
	(c) Development and selection of EFs	Yes	E.4, I.5, I.11, A.2, A.13, W.5, W.7
	(d) Collection and selection of AD	Yes	I.4, I.7, W.4
	(e) Reporting of recalculations	No	
	(f) Reporting of a consistent time series	Yes	W.7

[2] Issues are defined in decision 13/CP.20, annex, paragraph 81.

[3] Problems are defined in decision 22/CMP.1, annex, paragraphs 68 and 69, as revised by decision 4/CMP.11.

Assessment			*Issue or problem ID#(s) in table 3 and/or 5[a]*
	(g) Reporting of uncertainties, including methodologies	No	
	(h) QA/QC	QA/QC procedures were assessed in the context of the national system (see para. 2 in this table)	
	(i) Missing categories/completeness[b]	Yes	I.8, I.15, A.12, W.2, KL.5
	(j) Application of corrections to the inventory	No	
Significance threshold	For categories reported as insignificant, has the Party provided sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines?	NA	
Description of trends	Did the ERT conclude that the description in the NIR of the trends for the different gases and sectors is reasonable?	No	I.3
Supplementary information under the Kyoto Protocol	2. Have any issues been identified related to the national system:		
	(a) The overall organization of the national system, including the effectiveness and reliability of the institutional, procedural and legal arrangements	Yes	G.2, G.6
	(b) Performance of the national system functions	Yes	G.1
	3. Have any issues been identified related to the national registry:		
	(a) Overall functioning of the national registry	NA	
	(b) Performance of the functions of the national registry and the technical standards for data exchange	Yes	G.3
	4. Have any issues been identified related to reporting of information on ERUs, CERs, AAUs and RMUs and on discrepancies reported in accordance with decision 15/CMP.1, annex, chapter I.E, taking into consideration any findings or recommendations contained in the SIAR?	NA	
	5. Have any issues been identified in matters related to Article 3, paragraph 14, of the Kyoto Protocol, specifically problems related to the transparency, completeness or timeliness of reporting on the Party's activities related to the priority actions listed in decision 15/CMP.1, annex, paragraph 24, including any changes since the previous annual submission?	Yes	G.7
	6. Have any issues been identified related to the reporting of LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as follows:		
	(a) Reporting requirements in decision 2/CMP.8, annex II, paragraphs 1–5	No	
	(b) Demonstration of methodological consistency between the reference level and reporting on FM in accordance with decision 2/CMP.7,	No	

Assessment			*Issue or problem ID#(s) in table 3 and/or 5[a]*
	annex, paragraph 14		
	(c) Reporting requirements of decision 6/CMP.9	No	
	(d) Country-specific information to support provisions for natural disturbances, in accordance with decision 2/CMP.7, annex, paragraphs 33 and 34	NA	
CPR	Was the CPR reported in accordance with the annex to decision 18/CP.7, the annex to decision 11/CMP.1 and decision 1/CMP.8, paragraph 18?	NA	
Adjustments	Has the ERT applied an adjustment under Article 5, paragraph 2, of the Kyoto Protocol?	NA	
	Did the Party submit a revised estimate to replace a previously applied adjustment?	NA	
Response from the Party during the review	Has the Party provided the ERT with responses to the questions raised, including the data and information necessary for the assessment of conformity with the UNFCCC Annex I inventory reporting guidelines and any further guidance adopted by the Conference of the Parties?	Yes	
Recommendation for an exceptional in-country review	On the basis of the issues identified, does the ERT recommend that the next review be conducted as an in-country review?	No	
Questions of implementation	Did the ERT list a question of implementation?	No	

[a] The ERT identified additional issues and/or problems in all sectors that are not listed in this table but are included in table 3 and/or 5.

[b] Missing categories for which methods are provided in the 2006 IPCC Guidelines may affect completeness and are listed in annex III.

III. Status of implementation of issues and/or problems raised in the previous review report

6. Table 3 compiles all the recommendations made in previous review reports that were included in the previous review report, published on 18 September 2017.[4] For each issue and/or problem, the ERT specified whether it believes the issue and/or problem has been resolved by the conclusion of the review of the 2017 annual submission and provided the rationale for its determination, which takes into consideration the publication date of the previous review report and national circumstances.

[4] FCCC/ARR/2016/RUS.

Table 3
Status of implementation of issues and/or problems raised in the previous review report of the Russian Federation

ID#	*Issue and/or problem classification[a]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
General			
G.1	Annual submission (G.1, 2016) (G.1, 2015) (7, 2014) (6, 2013) (6, 2012) Adherence to UNFCCC Annex I inventory reporting guidelines	Submit the inventory by 15 April of each year.	Not resolved. The Party submitted the CRF tables on 14 April 2017. However, the NIR was submitted only on 25 July 2017, together with a resubmission of the CRF tables (see also ID# G.6 in table 5).
G.2	QA/QC and verification (G.5, 2016) Adherence to UNFCCC Annex I inventory reporting guidelines	Adjust the QA/QC plan to ensure timely submission of the NIR.	Not resolved. The NIR was submitted only on 25 July 2017. There is no information in the NIR that the QA/QC plan was adjusted to ensure timely submission of the NIR (see also ID# G.6 in table 5).
G.3	National registry (G.6, 2016) (G.6, 2015) Completeness	Include 2014 and 2015 SEF tables for the second commitment period of the Kyoto Protocol in the annual submission, as recommended in the SIAR.	Not resolved. The submissions of the 2014 and 2015 SEF tables for the second commitment period are still pending. Parties included in Annex I without a quantified emission limitation or reduction commitment, according to decision 3/CMP.11, paragraph 14, "shall continue to provide…information on the units in its registry, by submitting the standard electronic format tables in conjunction with its annual inventory submission for the second commitment period…if its registry is connected to the international transaction log at any time during the relevant calendar year".
Energy			
E.1	1. General (energy sector) (E.1, 2016) (E.1, 2015) (19, 2014) (21, 2013) (33, 2012) Comparability	Review the use of notation keys for all categories in the energy sector and ensure the appropriate selection of notation keys for the complete time series.	Addressing. The Russian Federation reviewed and selected the appropriate notation keys for the entire time series for all categories, except one. The only notation key still to be reviewed is in CRF table 1.A(a)s3 (the Party reported "NO" for the AD and CO_2, CH_4 and N_2O emissions under category 1.A.3.e.1 (pipeline transport)). See ID# E.3 below.
E.2	1.A.3.a Domestic aviation – liquid fuels – CO_2, CH_4 and N_2O (E.12, 2016) (E.12, 2015) Transparency	Explain in the NIR that fuel use for domestic and international civil aviation is estimated using a bottom-up approach (based on flying times and flow rates) and that the difference between the fuel consumption estimated by this approach and the overall fuel consumption considered as aviation fuel in the energy balance is calculated, and corresponding emissions are reported under the	Resolved. An explanation has been included in the NIR (section 3.2.4.3.3, p.46).

ID#	*Issue and/or problem classification[a]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
		category other (1.A.5).	
E.3	1.A.3.e Other transportation – liquid fuels – CO_2 (E.9, 2016) (E.9, 2015) (32, 2014) (39, 2013) Comparability	Report separately CO_2 emissions from pipeline transport – liquid fuel reported under other transportation in 1990 and 1991 using extrapolation techniques, if necessary.	Not resolved. The Party reported in the NIR (section 3.2.4.7, p.61) that, following previous review recommendations, the emissions from pipeline transport (liquid fuels) for 1990 and 1991 were extrapolated using the total volume of oil transportation (surrogate data) as a driver. To avoid double counting, the extrapolated oil volumes burned during pipeline transportation were excluded from those under category 1.A.5 (other). However, during the review, the ERT noted, and the Party confirmed, that the results of the calculations were not reported either in the NIR or in CRF table 1.A(a)s3. In addition, the Party continues to report the notation key "NO" for the AD and CO_2, CH_4 and N_2O emissions for 1990 and 1991 in CRF table 1.A(a)s3, even though the Party clarified during the 2014 review that these emissions occurred in the country in 1990 and 1991 and that the notation key "IE" should therefore be reported.
E.4	1.B.2.b Natural gas – gaseous fuels – CO_2 and CH_4 (E.13, 2016) Accuracy	Consider the results of the research into fugitive CO_2 and CH_4 emissions from natural gas and develop national EFs for the entire time series or, if that cannot be done in time for the next annual submission, include in the NIR information on the progress in development of the national EFs.	Addressing. Information on the progress in development of the national EFs is included in the NIR (section 3.3.4.5, p.90). In 2016, with the support of the Ministry of Energy, country-specific EFs for the oil and gas industry were developed and in 2017 they were subject to testing and approval. The Party is planning to use these EFs in the 2018 submission.
IPPU			
I.1	2.A.3 Glass production – CO_2 (I.8, 2016) (I.8, 2015) Completeness	Contact glass wool and glass fibre manufacturers to collect data for glass wool production, estimate the emissions and report them in this category for the entire time series.	Resolved. CO_2 emissions from glass wool manufacturing are reported in category 2.A.3 for the entire time series. The NIR (pp.91 and 92) provides methodological information on the calculation of glass wool emission estimates.
I.2	2.B.1 Ammonia production – CO_2 (I.9, 2016) (I.9, 2015) Transparency	Include in the NIR a reference for the country-specific carbon content of natural gas.	Resolved. The NIR (p.118) contains the reference for the country-specific carbon content of natural gas.
I.3	2.C.1 Iron and steel production – CO_2 (I.4, 2016) (I.4, 2015) (35, 2014) Transparency	Include in the NIR information on significant changes in IEFs (e.g. the CO_2 IEF for pig iron) since 2011 due to the implementation of 10 JI projects on iron production efficiency.	Not resolved. Information was not provided in the NIR. During the review, the Russian Federation explained that the work on the collection of improved AD for coke consumption in pig iron production (category 2.C.1.b) is in progress, but did not provide information on the time frame for implementation of this recommendation (see also ID#s I.4 and I.5 below and I.13 in table 5).

ID#	*Issue and/or problem classification*[a]	*Recommendation made in previous review report*	*ERT assessment and rationale*
I.4	2.C.1 Iron and steel production – CO_2 (I.10, 2016) (I.10, 2015) Accuracy	In addition to explaining in the NIR the decrease in the CO_2 IEF for pig iron in recent years as recommended in issue ID# I.3 above, include the collection of improved AD for coke consumption in iron and steel production as an activity in the inventory improvement plan (recognizing that such data collection will take time and may not be possible to implement), and report on the planned improvement in the NIR.	Not resolved. The Party has not included the collection of improved AD for coke consumption in the iron and steel industry in the inventory improvement plan. The ERT noted that coke consumption in the iron and steel industry is still overestimated in the 2017 submission for the period 2012–2015. During the review, the Party explained that new country-specific parameters for category 2.C.1 (iron and steel production) will be introduced in the next inventory submission (see also ID#s I.3 above, I.5 below and I.13 in table 5).
I.5	2.C.1 Iron and steel production – CO_2 (I.11, 2016) (I.11, 2015) Accuracy	Use recent country-specific parameters that have been measured in JI projects in iron and steel plants for a verification of the appropriateness of the current parameters used in the inventory. If the verification indicates that these parameters have changed considerably compared to those currently used in the inventory, elaborate a plan (as part of the inventory improvement plan) to update and improve these parameters reflecting improved efficiencies of the plants, and report on this activity in the NIR.	Not resolved. The Party has not used the recent parameters from JI projects to verify the country-specific parameters used (e.g. for the carbon content of coke and of iron and steel) and no improvement plan has been elaborated to improve these parameters. During the review, the Russian Federation explained that the required work was in progress and that additional information would be provided in the next submission (see ID#s I.3 and I.4 above and I.13 in table 5).
I.6	2.C.3 Aluminium production – PFCs (I.12, 2016) (I.12, 2015) Transparency	Add an explanation to table 4.44 in the NIR explaining why measured plant-specific parameters are not used in the inventory.	Addressing. During the review, the Russian Federation explained that tables 4.44 and 4.45 were removed from the NIR in the 2017 annual submission. This decision was made to avoid a misunderstanding of the method applied to estimate emissions in this category. The Party explained that data on plant-specific measurements are available for one aluminium plant for 2007 and 2010 only and varied considerably. Therefore, the emission estimates were calculated using the IPCC tier 2 methodology as it was not possible to implement the tier 3 methodology using these data owing to time-series consistency issues. However, the ERT is of the view that the Party should include in the NIR the explanation provided above, even if the table is not included. In addition, the ERT noted that in the NIR (p.123), the Party made reference in the text to tables 4.44 (for C_2F_6 and CF_4 plant-specific parameters) and 4.45 (for comparison of the tier 2 and tier 3b results), even though the tables were not included in the 2017 submission. The Party informed the ERT that the reference to the tables in text of the NIR will be updated to reflect the changes made to the reporting of

ID#	Issue and/or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
			this category.
I.7	2.D Non-energy products from fuels and solvent use – CO_2 (I.13, 2016) (I.13, 2015) Accuracy	Investigate and, as appropriate, resolve the discrepancy in reporting the CO_2 emissions from the NEU of fuels excluded from the energy sector (indicated as reported under non-energy products from fuels and solvent use in CRF table 1.A(d)) and those actually reported in the inventory in the IPPU sector under category 2.D (non-energy products from fuels and solvent use in CRF table 2(I).A-Hs2); and explain the reporting of NEU for the category 2.D in the NIR.	Not resolved. There continues to be a discrepancy between CRF table 1.A(d) (which indicates that 108,264.58 kt CO_2 eq were reported under NEU from fuels and solvent use) and CRF table 2(I).A-Hs2 (which reports emissions of 1,649.71 kt CO_2). The ERT considers that the discrepancies between NEU of fuels excluded from the energy sector (CRF table 1.A(d)) and reported under the IPPU sector (CRF table 2(I).A-Hs2) are too significant to be simply a reporting issue. The ERT believes that future ERTs should consider this issue further to ensure that there is not an underestimate of emissions from this activity, noting that adjustments cannot be applied to the Russian Federation's annual submission.
I.8	2.E Electronics industry – PFCs (I.15, 2016) (I.15, 2015) Completeness	Collect the AD needed to implement the methodology provided in the 2006 IPCC Guidelines for this category, and report the emissions accordingly.	Not resolved. The Russian Federation explained during the review that it is considering opportunities for collecting the relevant AD from other sources, taking into account the availability of financial resources. During the previous review, the Party provided information explaining that a resource-intensive study would be needed to identify new chemicals and collect the necessary data to implement the 2006 IPCC Guidelines, although a small amount of emissions could be expected for this category.
I.9	2.E Electronics industry – PFCs (I.15, 2016) (I.15, 2015) Transparency	Report in the NIR on progress in the implementation of AD collection.	Addressing. The NIR (section 4.6.2, p.130) includes a brief reference to progress made; however, the ERT is of the view that the Party should report more clearly in the NIR on the progress made to collect the AD until the recommendation in ID# I.8 above is implemented.
I.10	2.E Electronics industry – NF_3 (I.16, 2016) (I.16, 2015) Transparency	Include in the NIR a statement that the Party has not identified any evidence of the use of NF_3 in the electronics industry and that the emissions are therefore reported using the notation key "NO".	Resolved. The Party included the required explanation in the NIR (section 4.6.1, p.130) as a footnote to table 4.56.
Agriculture			
A.1	3. General (agriculture) – CH_4 and N_2O (A.6, 2016) (A.6, 2015) Accuracy	Revise the estimate of the average annual population of fur-bearing animals by taking into account the number of animals produced annually and the number of animals born during the year, in accordance with the 2006 IPCC Guidelines (volume 4, chapter 10.2).	Resolved. In the NIR (section 5.3.2, pp.152 and 153), the Russian Federation explained that it has implemented the required recommendation for litter of minks, foxes and artic foxes. For nutria and farm animals the Party continues to use population numbers as of 1 January as representative of the average annual population. The Party justified this assumption by reporting that for nutria, the life expectancy is of about 12 months, and for farm animals, reproduction is not of a

ID#	*Issue and/or problem classification*[a]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			seasonal nature and slaughtering does not occur until the animals are one year old. The ERT agrees with this explanation.
A.2	3.B Manure management – CH_4 and N_2O (A.8, 2016) (A.8, 2015) Accuracy	Confirm the assumption that liquid manure is not usually stirred, for example by conducting a small-scale farm survey or asking national agricultural organizations to advise on the appropriateness of the assumption. In the event that the assumption cannot be confirmed, apply MCF value of 17 per cent (default value in the 2006 IPCC Guidelines, volume 4, table 10.17 for liquid systems without natural crust cover) in order to ensure that CH_4 emissions from manure management are not underestimated and use an N_2O EF which is applicable to liquid manure management systems without a natural crust cover.	Not resolved. During the review the Russian Federation explained that, owing to the late publication of the 2016 annual review report, the recalculation of the emission estimates using an MCF of 17 per cent was not implemented in the 2017 submission. The Party states in the NIR that getting more accurate data on distribution systems of liquid storage between 'natural' and crust is not possible, because no national data/publications on this topic exist, and has not provided to the ERT during the review an explanation on how the small-scale survey or the appropriateness of the assumption of an MCF of 10 per cent will be done.
A.3	3.B Manure management – N_2O (A.9, 2016) (A.9, 2015) Accuracy	Ensure that the total amount of N generated for livestock categories reported in CRF table 3.B(b) corresponds to the amount of N calculated as Nex multiplied by the population value in the same table: 1990 for swine; 2012 for dairy and non-dairy cattle, swine and sheep; 2013 for dairy cattle; and 2014 for fur-bearing animals.	Resolved. The total amount of N excreted (kg N/year) for livestock categories reported in CRF table 3.B(b) corresponds to the amount of N calculated as Nex (kg N/head/year) multiplied by the population value in the same CRF table.
A.4	3.B.4 Other livestock – CH_4 (A.7, 2016) (A.7, 2015) Transparency	Provide in the NIR the calculation for CH_4 emissions from ostrich manure management as provided to the ERT during the review (i.e. using the AD for 2006 and the default EF from the 2006 IPCC Guidelines, volume 4, table 10A-9) to justify the exclusion of CH_4 emissions from ostrich manure management as an insignificant source.	Resolved. The Russian Federation provided an explanation of the calculation for the estimates of CH_4 emissions from ostrich manure management and justified the exclusion of those emissions based on the likely level of emissions, in accordance with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines (see the NIR, section 5.4.2, p.169).
A.5	3.D.a.1 Inorganic N fertilizers – N_2O (A.10, 2016) (A.10, 2015) Transparency	Remove from the NIR the reference to the outdated technological maps that are not used in the estimation of emissions from synthetic fertilizers.	Resolved. The reference to outdated technological maps was removed from the NIR (see section 5.7.2).
A.6	3.D.a.4 Crop residues – N_2O (A.11, 2016) (A.11, 2015) Transparency	Include in the NIR an explanation of the methodology used to estimate the total amount of above-ground crop residues removed from the fields and excluded from the estimation of N_2O emissions from crop residues.	Resolved. The Party included information in the NIR (in section 5.2.2.2, p.175) under category 3.B.5 (indirect N_2O emissions). During the review the Party further informed the ERT that the Russian Federation applies a country-specific method to estimate the amount of N input into soils with crop residues (NIR section 5.7.2) and, in the case

ID#	Issue and/or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
			of the Russian Federation, the amount of N from crop residues in total is not estimated and therefore not reported. This approach is in line with the 2006 IPCC Guidelines.
A.7	3.D.a.6 Cultivation of organic soils (histosols) – N_2O (A.5, 2016) (A.5, 2015) (54, 2014) Transparency	Include a clearer description of the derivation of the N_2O EF from the cultivation of histosols by providing all relevant supporting information, including the period of measurement, a description of the process by which this EF is derived and a description of the source.	Resolved. The Party provided the required information in the NIR (section 5.7.2, p.188), by including the period of measurement (April to September 2008) and by explaining that the vegetation period in 2008 was characterized by average temperatures and humidity characteristic of the northern regions of the Russian Federation in recent decades.
LULUCF			
L.1	4. General (LULUCF) (L.4, 2016) (L.4, 2015) (61, 2014) Transparency	Continue to strengthen the QA/QC procedures in the LULUCF sector paying particular attention to checking that references in the NIR are correct and consistent with the CRF tables.	Resolved. The Party has increased the consistency between the NIR and the CRF table related to the information of managed and unmanaged land (as recommended in ID# 61, 2014).
L.2	4. General (LULUCF) (L.11, 2016) Accuracy	Strengthen the QA/QC procedures in the LULUCF sector, paying particular attention to checking that any unexpected trends in AD relating to managed and unmanaged lands and emissions across the time series are explained in the NIR.	Resolved. The ERT has not identified in the current submission any unexpected trends in AD relating to managed and unmanaged lands and removals across the time series.
L.3	Land representation (L.12, 2016) (L.11, 2015) Transparency	Correct the reporting in CRF table 4.1 by presenting in the table annual, rather than cumulative, land-use changes.	Resolved. The ERT noted that the areas reported in CRF table 4.1 of the 2017 submission represent the annual land-use changes.
L.4	Land representation (L.13, 2016) (L.12, 2015) Transparency	Include in the NIR an explanation of and a justification for the use of different conversion periods (50 years for cropland converted to forest land or grassland, and 20 years for other land-use changes)	Resolved. The Russian Federation provided a justification for using the country-specific conversion period for cropland converted to forest land and grassland in the NIR (p.310).
L.5	Land representation (L.13, 2016) (L.12, 2015) Accuracy	Include the impact of pre-1990 conversions for land converted to forest land and cropland converted to grassland in the reported emissions and removals.	Addressing. During the review, the Party explained that it will include the impact of pre-1990 conversions for land converted to forest land and cropland converted to grassland in the reported emissions and removals in the next NIR.
Waste			
W.1	5. General (waste) (W.1, 2016) (W.1, 2015) (74, 2014) Adherence to UNFCCC Annex I inventory reporting	Include more specific results of the QC measures undertaken.	Resolved. Specific results of the QC measures undertaken are presented in the NIR, in the section titled "Quality assurance and quality control" (pp.384, 386, 389, 396 and 398), as recommended in previous reviews. The ERT notes that the 2017 submission still contains several QC problems (see ID# G.5 and W.3 in

ID[a]	*Issue and/or problem classification[b]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
	guidelines		table 5).
W.2	5.C.2 Open burning of waste – CO_2, CH_4 and N_2O (W.6, 2016) (W.6, 2015) Completeness	Investigate the occurrence of the open burning of waste and, if the emissions are considered relevant, quantify them, or, if the emissions are assumed to be negligible, use the notation key "NE" in CRF table 5.C and justify the use of the notation key in accordance with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines.	Not resolved. In the documentation box below CRF table 5.C, it is stated that "Open burning of waste in Russia has been considered to be negligible". However, the notation key "NO" is used. Justification for the exclusion of emissions in terms of the likely level of emissions is not provided in the NIR.
KP-LULUCF			
KL.1	General (KP-LULUCF) (KL.1, 2016) (KL.1 2015) Transparency	Report, in CRF table NIR-2 under "other", the correct value for area not subject to activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol since 1990.	Resolved. The Party filled in the appropriate AD in CRF table NIR-2 for the category "other".
KL.2	General (KP-LULUCF) (KL.2, 2016) (KL.2, 2015) Transparency	Ensure the consistency of the total area in CRF table NIR-2 with the area reported in CRF table 4.1.	Not resolved. The problem was originally identified for 2014. In the current submission the ERT still found that, for 2014, there is a discrepancy between CRF table 4.1 (1,712,519.10 kha) and CRF table NIR-2 (1,712,531.27 kha). In addition, the ERT found in the current submission discrepancies between both tables for 2012 (1,709,824.60 versus 1,711,914.24 kha). The ERT considers that this can be associated with differences in total area reported in CRF table NIR-2 (e.g. between 2013 and 2014 area increased by 2,706.67 kha; between 2012 and 2013 area decreased by 2,089.64 kha; between 2011 and 2012 area increased by 2,089.64 kha); while in CRF table 4.1 only differences between 2013 and 2014 can be observed (an increase in 2,694.50 kha).
KL.3	Deforestation – CO_2 (KL.3, 2016) (KL.3, 2015) Comparability	Report correct AD for deforestation in CRF table 4(KP-I)A.2, in particular, by reporting as AD for deforestation the sum of all areas subject to deforestation since 1990.	Resolved. The Party reported the correct AD for deforestation in CRF table 4(KP-I)A.2, that is, cumulative deforested areas since 1990 (605.12 kha for 2015).
KL.4	Deforestation – CO_2 (KL.3, 2016) Transparency	Include under information items for forest land only the area subject to past deforestation events that has been subsequently reforested.	Not resolved. The Party did not report the area subject to past deforestation events (e.g. in 1995) that has been subsequently reforested (e.g. in 2000); instead, information items under CRF table 4(KP-I)A.2 contain the annual deforested area for the given year (12.71 kha for 2015). In addition, the ERT identified further issues (see KL.9 in table 5).
KL.5	Deforestation – CO_2 (KL.4, 2016) (KL.4, 2015)	Provide additional information on the deforested areas with organic soils (including the share of the deforested area covered with	Not resolved. The Party continues to report the area of organic soils as "IE" and the emissions from these soils as "NO". Further, the Party has not yet provided any

ID#	*Issue and/or problem classification*[a]	*Recommendation made in previous review report*	*ERT assessment and rationale*
	Completeness	buildings and roads) and measured data or references justifying the assumption that there are no CO_2 emissions from these organic soils, or alternatively report emissions from organic soils in accordance with the 2006 IPCC Guidelines and the Kyoto Protocol Supplement.	information on the deforested areas with organic soils to justify that there are no CO_2 emissions from these soils. During the review, the Party informed the ERT that it is investigating the information on the rules and norms of construction for different types of infrastructure on organic soils. The Party is planning to report this information in the next submission.
KL.6	FM – CO_2, CH_4 and N_2O (KL.5, 2016) (KL.5, 2015) Transparency	Use the notation key "NA" for the FM cap in the CRF table "accounting".	Resolved. The Party reported "NA" for the FM cap in the CRF table "accounting".
KL.7	FM – CO_2, CH_4 and N_2O (KL.6, 2016) (KL.6, 2015) Transparency	Report the correct value of the technical correction for the base year 1990 in CRF table 4(KP-I)B.1.1 and describe in the NIR how it was calculated.	Addressing. The Party reported the correct value of the technical correction of the FMRL for the base year 1990 in CRF table 4(KP-I)B.1.1. However, the description of how it was calculated is missing in the NIR. During the review the Party informed the ERT that it will include it in the next submission.
KL.8	N_2O emissions from N mineralization/ immobilization due to carbon loss/gain associated with land-use conversions and management change in mineral soils – N_2O (KL.7, 2016) (KL.7, 2015) Completeness	Report the N_2O emissions from this category in CRF table 4(KP-II)3 for activities under which such emissions occur.	Resolved. In the 2017 submission, the Party reported the N_2O emissions related to carbon loss associated with land-use conversion from deforestation in CRF table 4(KP-II)3 as recommended in the previous review.

[a] References in parentheses are to the paragraph(s) and the year(s) of the previous review report(s) where the issue and/or problem was raised. Issues are identified in accordance with paragraphs 80–83 of the UNFCCC review guidelines and classified as per paragraph 81 of the same guidelines. Problems are identified and classified as problems of transparency, accuracy, consistency, completeness or comparability in accordance with paragraph 69 of the Article 8 review guidelines, in conjunction with decision 4/CMP.11.

IV. Issues identified in three successive reviews and not addressed by the Party

7. In accordance with paragraph 83 of the UNFCCC review guidelines, the ERT noted that the issues included in table 4 have been identified in three successive reviews, including the review of the 2017 annual submission of the Russian Federation, and have not been addressed by the Party.

Table 4
Issues identified in three successive reviews and not addressed by the Russian Federation

ID#	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed*[a]
General		
G.1	Submit the inventory by 15 April of each year	5 (2012–2017)

ID[a]	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed[b]*
Energy		
E.1	Review the use of notation keys for all categories in the energy sector and ensure the appropriate selection of notation keys for the complete time series	5 (2012–2017)
E.3	Report separately CO_2 emissions from pipeline transport – liquid fuel reported under other transportation in 1990 and 1991 using extrapolation techniques, if necessary	4 (2013–2017)
IPPU		
I.3	Include in the NIR information on significant changes in IEFs (e.g. the CO_2 IEF for pig iron) since 2011 due to the implementation of 10 JI projects on iron production efficiency	3 (2014–2017)
Agriculture		
	No such issues for the agriculture sector were identified	
LULUCF		
	No such issues for the LULUCF sector were identified	
Waste		
	No such issues for the waste sector were identified	
KP-LULUCF		
	No such issues for KP-LULUCF activities were identified	

[a] The review of the 2016 annual submission was held in conjunction with the review of the 2015 annual submission. Since the reviews of the 2015 and 2016 annual submissions were not "successive" reviews, but were held in conjunction, for the purpose of counting successive years in table 4, 2015/2016 are considered as one year.

V. Additional findings made during the 2017 individual inventory review

8. Table 5 contains findings made by the ERT during the individual review of the 2017 annual submission of the Russian Federation that are additional to those identified in table 3.

Table 5
Additional findings made during the 2017 individual review of the annual submission of the Russian Federation

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
General			
G.5	QA/QC and verification	The ERT noted that, in several parts of the NIR, there are systematic QA/QC errors related to the information reported (see ID#s I.6 in table 3 and E.8 and W.3 below). There are also many typographical errors across the entire NIR; for example, on page 175 the Party refers to section 5.2.2.2 under section 5.5.2; and on pages 396 and 398 the Party makes reference to section 7.2.4 under sections 7.5 and 7.6, respectively. Additional issues were identified during the 2017 review under ID#s I.13, A.8, A.10, A.12, L.6, L.7 below. The ERT recommends that the Russian Federation improve the QA/QC process undertaken on the NIR and report on the improvements made in the NIR.	Adherence to the UNFCCC Annex I inventory reporting guidelines
G.6	National system	The ERT noted that the Russian Federation submitted the information required under Article 7 of the Kyoto Protocol after the due date of 15 April 2017. The Russian Federation submitted the CRF tables on 14 April 2017, but no NIR was provided at that time. The complete 2017 submission, containing both the CRF tables and the NIR, was submitted on 25 July 2017. In addition, the ERT noted that previous review reports recommended that the Party adhere to the timelines set out in decision 15/CMP.1, paragraph 3(a) (see FCCC/ARR/2012/RUS; para. 6, FCCC/ARR/2013/RUS, para. 6; and FCCC/ARR/2014/RUS, para. 7). By not reporting the NIR within six weeks of the submission due date, the ERT considers that the Russian Federation has not met the mandatory requirements in accordance with the "Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol" (decision 15/CMP.1 in conjunction with decision 3/CMP.11). Furthermore, the ERT considers that the late submission under Article 7 is indicative of a problem with the national system. In particular, the ERT considers that, by submitting its annual submission more than six weeks after the due date, the Russian Federation has not met the mandatory requirements in accordance with the "Guidelines for national systems for the estimation of anthropogenic greenhouse gas emissions by sources and removals by sinks under Article 5, paragraph 1, of the Kyoto Protocol" (annex to decision 19/CMP.1, in conjunction with decision 3/CMP.11) with respect to the following functions of the national system: (a) Ensuring sufficient capacity for the timely performance of the functions of the national system (para. 10(b)); (b) Preparing national annual inventories and supplementary information in a timely manner (para. 10(d)). The ERT included this potential problem related to the national system in the list of potential problems and further questions raised by the ERT. During the review, the Party provided a detailed action plan with a timeline to demonstrate that the Russian Federation has the necessary capacity in place to ensure the timely performance of the national system. The Party also clarified that on 15 May 2017 the Government of the Russian Federation adopted Regulation No. 930-r that introduced changes to the previous Regulation No. 278-r of 1 March 2006 on the national system. According to this new regulation, Roshydromet is mandated to ensure the functioning of the national system, coordination with ministries, federal agencies and institutions involved in the preparation of the GHG inventory and other relevant national reporting in accordance with the Convention and its Kyoto Protocol. One of the important tasks of Roshydromet is submitting the GHG inventory to the Ministry of Natural Resources as agreed with the	Adherence to reporting guidelines under Article 7, paragraph 1, of the Kyoto Protocol

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem[20] If yes, classify by type
		ministries and federal agencies involved in the national system before 25 March. The regulation also sets time limits for these ministries and federal agencies to reconcile the NIR within 30 days of its receipt from Roshydromet. The revised regulation for the national system prescribes that the final approval of the NIR is to be performed by the Ministry of Natural Resources, while previously it had to be approved by the Government of the Russian Federation upon the recommendation of the Ministry of Natural Resources. This change is essential in order to reduce the time required for approval and ensure the timely submission of the GHG inventory of the Russian Federation. The ERT concluded that the action plan provided by the Party and the new regulation in force might allow the timely performance of the national system (see also ID# G.1 in table 3). The ERT recommends that the Russian Federation implement the necessary improvements to the functions of the national system, ensuring that it will submit all information required under Article 7 of the Kyoto Protocol no later than the due date in the next annual submission. The ERT also recommends that the Party report in the next annual submission on progress made regarding the detailed action plan.	
G.7	Article 3, paragraph 14, of the Kyoto Protocol	The Russian Federation reported in the NIR (section 10.4, p.442) the information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol. The ERT noted that the information reported is the same as the information provided in the previous submission, except for some country names, and asked the Party whether any other changes have occurred since the previous annual submission. In response, the Party acknowledged the following changes in its reporting under Article 3, paragraph 14: (1) the update of the efficient utilization of associated petroleum gas achieved as a result of national policy and measures on the mitigation of adverse effects on the global climate system (in 2015, the utilization of associated petroleum gas reached 88 per cent compared to the level of 86 per cent in 2014, as reported in the previous inventory submission); (2) the provision of more specific information on nuclear power plant construction during 2015 and 2016 (during the period 2015–2016, 34 facilities were under construction by the Rosatom State Russian Company in other countries); and (3) an increase in the number of foreign students from developing countries that study at the universities of the Russian Federation as a result of financial support provided by the Government of the Russian Federation. In the 2017 annual submission, the number of developing country Parties whose citizens receive higher and postgraduate education at the universities of the Russian Federation increased to include Angola, Bangladesh, Bolivia (Plurinational State of), Burundi, Cuba and El Salvador, among others. The ERT recommends that the Russian Federation report in the NIR any changes that have occurred to the information provided on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, compared with the information reported in its previous submission, in accordance with decision 15/CMP.1, annex, paragraph 25.	Adherence to reporting guidelines under Article 7, paragraph 1, of the Kyoto Protocol
Energy			
E.5	Fuel combustion – reference approach – all fuels – CO_2	The ERT noted that in the 2017 annual submission, the difference in CO_2 emissions between the reference and sectoral approaches varies significantly across the time series. For example, it is positive (3.8 per cent) for 1990 and negative (–4.6 per cent) for 2010, and as high as 7.0 per cent in 1991. The underlying reasons for the discrepancies in CO_2 emissions between the reference and sectoral approaches for the entire time series are explained very generally in the NIR and are not analysed by fuel type, where the differences are much larger, for example, for 2015: +17.7 per cent for liquid fuel and –6.6 per cent	Not an issue/problem

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem[20] If yes, classify by type
		for solid fuel (for CO_2 emissions); +16.1 per cent for liquid fuels and –13.9 per cent for solid fuels (for fuel consumption). The ERT is of the view that the differences may originate from not accounted transfers of fuels between the categories (solid, liquid, gas) or incorrect assignment of the fuel types in the statistics, or owing to different approaches being used to measure and report the quantities and calorific values for the energy supply, transformation, final consumption, export, import, stock change, international bunkers and NEU parts of the statistics. It may also be the result of some activities that are not covered by the statistics (e.g. import, export, stocks, international bunkers or production/consumption entities) or unaccounted losses. The ERT considers that the reason for the difference in the CO_2 emission estimates between the two approaches is not sufficiently described in the NIR and encourages the Party to further investigate the underlying reasons for the discrepancies in CO_2 emissions between the reference and sectoral approaches for the entire time series and by fuel type, and provide a clearer explanation on the reasons behind the differences.	
E.6	1.A. Fuel combustion – sectoral approach – solid and gaseous fuels – CO_2	The ERT noted that country-specific CO_2 EFs for local types of coal and natural gas are reported in NIR table 3.8 (pp.34 and 35). The reported EFs account for the carbon oxidation that is specific to the coal type and the conditions and combustion technologies used in the country. However, the Party does not report information on the methodology used to assess the non-oxidized portion of the carbon in the NIR. During the review, the Party explained that for coal, the detailed methodology was presented in the NIRs up to 2015 and clarified that the EFs and oxidation factors for different coal types were estimated based on a long-term study of the conditions in coal basins, conducted by RAO Energy Systems of Russia (1999). This study was based on seven years of researching the power plants' combustion technology, and the distribution and share of coal types used for energy combustion at Russian power plants. The report of RAO Energy Systems of Russia exists only in hard copy and in Russian, and was presented to the ERT during the in-country reviews in 2009 and 2010, with copies of the most important parts of the report made available to the ERT during the centralized reviews. The Party also informed the ERT that some of the main findings of the RAO Energy Systems of Russia study are summarized and presented in the publication by Dudek et al. (2002). For natural gas, the country-specific EF was introduced for the first time in the 2016 GHG inventory. The detailed methodology was presented in the 2015 NIR as a case study, as published in the article by Uvarova et al. (2015). The ERT welcomes the information provided by the Russian Federation and recommends that the Party include in the NIR a summary of the main findings of the studies, with references and a column in NIR table 3.8 for the oxidation factor (or fraction of carbon not oxidized) for every fuel listed.	Yes. Transparency
E.7	1.A.3.b Road transportation – liquid fuels – CO_2, CH_4 and N_2O	The Russian Federation reported in the NIR (section 3.2.4.3.5, p.51) that the calculation of the emissions for category 1.A.3.b was performed by the experts from the Moscow Road Transportation State Technical University, using the COPERT IV model (v.11.1), for the years 1990, 2000, 2005, 2010 and 2013. However, the ERT noted that the Party made only a brief reference to the approach used for the other years of the time series. During the review, the Party explained that for the other years of the time series (1991–1999, 2001–2004, 2006–2009, 2011 and 2012) both the AD (fuel consumption) and EFs for each fuel type and each vehicle category were calculated using linear interpolation. For the last two inventory years (2014 and 2015), the EFs for each vehicle category and AD (fuel consumption) were	Yes. Transparency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem[20] If yes, classify by type
		calculated using the surrogate data method, as provided in the 2006 IPCC Guidelines (volume 1, chapter 5). The total amount of vehicles (in different vehicle categories) was chosen as an indicator to simulate the trend for those years. The amount of motor fuel resulting from the interpolation and surrogate data methods were verified with the amount of fuel reported in the fuel energy balance for the corresponding years. For some years, if the calculated amount of fuel (mostly for gasoline) exceeded the total apparent consumption, the fuel amount reported in the fuel energy balance was used for the emissions inventory. The Party also explained that it is planning to use the COPERT IV model in the 2018 annual submission to calculate road transportation emissions for 2016. The ERT recommends that the Russian Federation improve the description of the method used to calculate emissions from road transportation in the NIR by including information on the approach used to estimate CO_2 emissions for the other years of the time series not estimated using the COPERT IV model (1991–1999, 2001–2004, 2006–2009, 2011–2012 and 2014–2015). The ERT also encourages the Party to ensure the consistency of the time series in accordance to the 2006 IPCC Guidelines, for example by making efforts to use the COPERT IV model for every year of the time series.	
E.8	1.A.3.e.i Pipeline transport – liquid and gaseous fuels – CO_2, CH_4 and N_2O	The Russian Federation reported in the NIR (section 3.2.4.3.2, p.45) that the fuels combusted in pipeline transport are crude oil and natural gas. However, the ERT noted that pipeline transport is commonly used for oil products as well (e.g. gasoline, diesel and other commodities) and asked the Party to clarify whether other products are transported by pipelines, and, if so, where the corresponding emissions are reported. The ERT also noted that the Party erroneously made reference in the NIR to category 1.A.1.e instead of 1.A.3.e.i for pipeline transport. In response, the Party informed the ERT that the reference to category 1.A.1.e is a typographical mistake and will be corrected in the NIR of the next submission. The Party also explained that under category 1.A.3.e.i (pipeline transport) the emissions are reported in accordance with the 2006 IPCC Guidelines (volume 2, chapter 3, table 3.1.1), which indicates that combustion-related emissions from the operation of pump stations and maintenance of pipelines, including transport of gases, liquids, slurry and other commodities via pipelines, should be included under this category, and, therefore, the inventory submission includes emissions from all types of pipelines (crude materials, oil products, etc.). The Party further explained that the calculations of the emissions were based on the AD on fuel combustion in pipeline transport reported in the fuel and energy balance of the Russian Federation. Nevertheless, the ERT noted that in CRF table 1.A(a)s3 only the emissions from crude oil and natural gas combustion are reported under category 1.A.3.e.i. The emissions from combustion of the other fuels reported in the national fuel and energy balance under pipeline transport were allocated under category 1.A.4.a (commercial and institutional) in the 2017 annual submission. According to the 2006 IPCC Guidelines (volume 2, chapter 3, table 3.1.1), only emissions from the distribution of natural gas or manufactured gas, water or steam from the distributor to final users are excluded from category 1.A.3.e.i and should be reported under categories 1.A.1.c.ii (oil and gas extraction) or 1.A.4.a (commercial and institutional). In response to the draft annual review report the Party further explained that in the country liquid fuels such as diesel oil, gasoline and residual fuel oil are used only for vehicle operation or for mobile diesel power generation stations and therefore only natural gas and crude oil are reported under category 1.A.3.e.i. The ERT therefore recommends that the Russian Federation investigate the use of all types of liquid and gaseous fuels that are combusted for operation of pipeline transport and report the emissions in accordance with the 2006 IPCC Guidelines (volume 2, chapter 3, table 3.1.1). The ERT also recommends that the Party correct the category reference in the NIR to 1.A.3.e.i (instead of	Yes. Comparability

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem[20] If yes, classify by type
		I.A.1.e).	
E.9	1.B.2.b Natural gas – gaseous fuels – CH_4	The Russian Federation reported in NIR table 3.35 (p.88) the country-specific CH_4 EF (0.009) for category 1.B.2.b.4 (transmission and storage). However, the Party did not provide information in the NIR on the unit of the EF and did not describe the methodology used to determine it. During the review, the Party explained that the country-specific EF is derived from the results of a measurement programme undertaken at gas transport facilities in 1996 and 1997. Experts from RAO Gazprom and Ruhrgaz AG, in collaboration with experts from the Russian research centre VNIIGaz and the Ecological Centre in Moscow were involved in conducting the measurements and evaluating the results. The Party further explained that the country-specific EF (0.009) is dimensionless and expressed as a fraction of CH_4 losses of the total volume of gas transported and provided an article (Dedikov et al., 1998) to justify the EF. However, the ERT analysed the publication, which explains that the natural gas losses were determined through an extensive measurement programme carried out in 1996 and 1997 on selected lines and, subsequently, the measurement results were extrapolated to the national scale. The ERT came to the conclusion that the dimension "cubic metre CH_4 per cubic metre natural gas" should be applied to the country-specific EF as natural gas contains less than 100 per cent CH_4. The ERT recommends that the Russian Federation include in the NIR an explanation of how the country-specific EF for category 1.B.2.b.4 (transmission and storage) was determined, describing the methodology used and making the appropriate reference to the publication by Dedikov et al. (1998).	Yes. Transparency
IPPU			
I.11	2.A.1 Cement production – CO_2	The Russian Federation reported in the NIR (section 4.2.2, p.93) that the EF for calculating CO_2 emissions in this category was estimated taking into account the content of CaO in clinker in accordance with the methodology in the 2006 IPCC Guidelines. The national CaO content was calculated as a weighted average based on the data from 19 producers out of 52 that represented 61 per cent of the total national cement production and this average value was applied for the whole time series. However, it was not clear to the ERT how often the national CaO value was revised. During the review, the Party explained that the CaO content was estimated in 2010 and has not been revised since then, with an assumption that limestone used in the cement industry originates from the same deposits and has a stable chemical composition. Given that the coverage of the plants was not complete and the production share of the plants might have changed since 2010, the ERT recommends that the Russian Federation verify if the country-specific CaO content is still representative of the national context and report on the results in the next submission.	Yes. Accuracy
I.12	2.A.4 Other process uses of carbonates – CO_2	The Russian Federation reported in the NIR (section 4.2.2, p.98) and in CRF table 2(I).A-Hs1 that category 2.A.4.d (other) comprises emissions from the use of limestone and dolomite in metallurgy (iron and steel production). However, the ERT noted that, in accordance with the 2006 IPCC Guidelines (volume 3, section 2.5.1, p.2.33), it is good practice to report emissions from the consumption of carbonates in the category where the carbonates are consumed and the CO_2 is emitted. Therefore, where carbonates are used as fluxes or slagging agents (e.g. in the iron and steel industry), emissions should be reported in the respective source categories where the carbonate is consumed. During the review, the Russian Federation explained that its reporting was due to the structural specifics of the national AD and that it would consider reporting CO_2 emissions from limestone/dolomite use under iron	Yes. Comparability

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem[20] If yes, classify by type
		and steel production (category 2.C.1) in the next inventory submission. The ERT recommends that the Russian Federation allocate CO_2 emissions from the use of limestone and dolomite in iron and steel production under category 2.C.1 in accordance with the 2006 IPCC Guidelines (volume 3, section 2.5.1, p.2.33).	
I.13	2.C.1 Iron and steel production – CO_2	The Russian Federation reported in the NIR (section 4.4.2, p.118) the method for calculating emissions from pig iron production (category 2.C.1.b). The Party stated that data on coke consumption in the iron and steel industry exist for 1990 and for the period 2000–2006, and that an average value of the specific coke consumption for pig iron production (t/t) was calculated (table 4.39 of the NIR) for application in the estimates of emissions for the periods 1991–1999 and 2007–2010. However, the ERT noted that this average value was calculated considering only data on coke consumption from the period 2000–2004. It was not clear to the ERT why the data from 2005 and 2006 were not used to estimate the average value of the specific coke consumption for pig iron production (t/t). During the review, the Party explained that data on coke consumption for category 2.C.1 (iron and steel production) are available only for 1990 and 2000–2004 in the "fuel and energy balance of the Russian Federation on the use of coke in the iron and steel industry" and that this typographical mistake will be corrected in the next NIR. The ERT recommends that, during the time that the recommendations made in ID#s I.3 and I.4 in table 3 are not implemented by the Party, the Russian Federation correct the text in the NIR to reflect the fact that, for the estimates of CO_2 emissions for the period 1991–1999 and 2007–2010, the Party used an average value of the specific coke consumption for pig iron production (t/t) calculated using data on coke consumption available for the period 2000–2004 (and not 2000–2006).	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
I.14	2.C.1 Iron and steel production – CO_2	In addition to ID# I.13 above, the ERT further noted that there is no explanation in the NIR on how coke consumption in pig iron production (category 2.C.1.b) is estimated for the period 2011–2015. In response, the Party explained that, in the period 2005–2011, CO_2 emissions from pig iron production were estimated using the average value of the specific coke rate for pig iron production in the period 2000–2004 (see table 4.39 of the NIR) provided by the "fuel and energy balance of the Russian Federation on the use of coke in the iron and steel industry". Since 2012, coke consumption in pig iron production estimated using this method has become greater than total coke consumption in the metal industry, according to the national energy balance provided by Rosstat, and therefore this method could no longer be used. Therefore, for the period 2012–2015, total coke consumption in the metal industry (ferrous and non-ferrous metallurgy) as contained in the national energy balance was used for the calculation of the CO_2 emission estimates for pig iron production. The Party also explained that this approach probably overestimates CO_2 emissions from pig iron production in the period 2012–2015 because it is believed that the specific coke consumption in pig iron production decreased in the period 2012–2015. However, it was not clear to the ERT from the Party's response which and how the methodology and assumptions were used to estimate the amount of coke used in pig iron production (for the period 2012–2015) based on the total coke consumption in the metal industry as contained in the national energy balance, and considering also that presumably there is coke consumption in other metal industries other than pig iron production. The ERT recommends that, while the recommendations made in ID#s I.3, I.4 and I.5 in table 3 are not implemented by the Party, the Russian Federation improve the transparency of the NIR by including information on how coke consumption in pig iron	Yes. Transparency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem[a] If yes, classify by type
		production (category 2.C.1.b) is estimated for the period 2011–2015, including the methodology and assumptions used to estimate the amount of coke used in pig iron production. The explanation should clarify whether coke consumption in pig iron production decreases in the period 2012–2015 and, if so, explain the reasons why CO_2 emissions from pig iron production in the period 2012–2015 are overestimated.	
I.15	2.B.1 Ammonia production – 2.D.3 Other (non-energy products from fuels and solvent use) CO_2	The Russian Federation reported in the NIR (p.104) that CO_2 recovered for downstream use (urea production) was subtracted from the total CO_2 emissions from ammonia production to avoid double counting in accordance with the 2006 IPCC Guidelines (volume 3, equation 3.1, p.3.12 and boxes 3.2 and 3.3, p.3.16). However, the ERT noted that the Party does not justify how the emissions from urea (subtracted from ammonia production) were accounted for in the other sectors and in which categories. The ERT further noted that no emissions are reported in the CRF table 2(I).A-Hs2 from urea use in automobile catalytic converters in transport (usually reported under category 2.D.3 according to footnote 11 in CRF table 1.A(a)s4) and that the Party reported in the NIR (table 5.23, p.194) the number of mineral products that use urea; however, it was not clear to the ERT whether these uses of urea resulted in CO_2 emissions and whether emissions were accounted for in the inventory. During the review, the Russian Federation explained that there are no national legislative and regulatory acts that require the use of urea-based catalytic converters (selective catalytic reduction) in transport. The Party further explained that there is no evidence that the use of urea in industry (as in the NIR table 5.23) caused CO_2 emissions and in addition no methodology is provided in the 2006 IPCC Guidelines to account for them. In response to the draft annual review report, the Russian Federation further clarified that CO_2 emissions from urea use as fertilizer were reported in CRF table 3.G-I (agriculture sector) under category 3.H (urea application) and that recovered CO_2 emissions were not "accounted completely under agriculture sector because a great amount of urea is exported from the Russian Federation and emissions associated with these exports shall be accounted for by other Parties". The ERT noted that the amount reported under category 3.H accounted for only 30 per cent of the CO_2 recovered for downstream use in 2015: for example, in CRF table 2(I).A-Hs1, CO_2 recovery under category 2.B.1 was reported as 4,727.19 Gg while in CRF table 3.G-I, CO_2 emissions from urea use as fertilizer in the agriculture sector was reported as 1,418.8 Gg. The ERT notes that the 2006 IPCC Guidelines (volume 3, chapter 3.2.2.1, p.3.12) state that "When a deduction is made for CO_2 used in urea production it is good practice to ensure that emissions from urea use are included elsewhere in the inventory" and footnote 5 in CRF table 2(I) A-Hs1 states that "should CO_2 from ammonia production be recovered for downstream use and be excluded from the reporting in category 2.B.1, the products and the purposes for which the CO_2 is used should be clearly explained in the NIR for the most recent inventory year. The related CO_2 emissions from these products and significant uses shall be reported in the relevant source categories in the inventory if these emissions occur within the borders of the Party concerned. Parties shall provide an overview in the NIR in which other source categories of the GHG inventory CO_2 emissions from significant uses of urea are reported." The ERT recommends that the Party provide an estimate for urea use in selective catalytic reduction (under category 2.D.3) using diesel consumption in road transport and applying equation 3.2.2 from the 2006 IPCC Guidelines (volume 2, chapter 3.2.1.1, p.3.12). In case emissions are insignificant the Party should provide a justification for their exclusion in terms of the likely level of emissions, in accordance with the requirements in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines. The	Yes Completeness

ID*	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem** If yes, classify by type
		ERT further recommends that the Party provide in the NIR a better explanation of which source categories' CO_2 emissions from significant uses of urea are reported, including the provision of data on export/import of urea (e.g. as a trade balance).	
Agriculture			
A.8	3. General (agriculture) – CH_4	The Russian Federation reported in NIR table 5.4 (p.157) the methodology used for calculating the gross energy and digestibility coefficients for pigs for 2015. The ERT noted that the coefficients for DE (DE%, expressed as a percentage of gross energy) reported in table 5.4 and used to estimate the overall DE for swine diet, do not correspond to those reported in table 3.1.2, p.43 (annex 3.1 to the NIR). Namely, the inconsistency in DE% was noticed for the following feedstuff types (reported in per cent): concentrates (without fodder) – reported as 77.02 (table 5.4) versus 75.20 (table 3.1.2); mixed fodder – reported as 40.27 (table 5.4) versus 79.43 (table 3.1.2); coarse feed (roughage) – reported as 48.36 (table 5.4) versus 40.27 (table 3.1.2); fresh fodder – reported as 90.84 (table 5.4) versus 49.53 (table 3.1.2); and animal feed – reported as 75.20 (table 5.4) versus 90.84 (table 3.1.2). In response the Party explained that the DE% values were misallocated in table 5.4 and will be corrected in the next submission in accordance with the values presented in table 3.1.2 (used in the calculation of emissions for swine, according to the Party). However, the ERT found further inconsistencies between the DE% values reported between table 3.1.2 (annex 3.1 to the NIR) and the spreadsheet provided to the ERT during the review (showing the calculation of emissions for swine), as follows (reported in per cent): for fresh grass – reported as 48.36 (spreadsheet) and 49.53 (table 3.1.2); and for mixed fodder – reported as 77.02 (spreadsheet) versus 79.43 (table 3.1.2), and both values also reported with a different value in table 5.4 (as above). In response, the Party explained that the DE% value reported for fresh fodder in the spreadsheet includes fresh green fodder (and this value is the correct one); and the DE% value reported for mixed fodder in the spreadsheet is the average DE% value of concentrates and mixed fodder, and the Party recognized that this approach was not appropriate. The ERT believes that future ERTs should consider this issue further to ensure that there is not an underestimate of emissions, noting that adjustments cannot be applied to the Russian Federation's submission. The ERT recommends that the Russian Federation consistently use and report in the CRF tables and the NIR (tables 5.4 and 3.1.2) the correct DE% values for swine. The ERT also recommends that the Party calculate the DE% value of mixed fodder without considering concentrates and recalculate the gross energy intake of swine reflecting the correct value of DE% for mixed fodder. In addition, considering that gross energy intake forms the basis of the estimate of the CH_4 EF for swine enteric fermentation and the Nex factor of swine, the ERT further recommends that the Party recalculate: CH_4 emissions from enteric fermentation (category 3.A); N_2O emissions from manure management (category 3.B) (due to swine livestock husbandry); and direct and indirect N_2O emissions from agricultural soils (category 3.D).	Yes. Accuracy
A.9	3.A.1 Cattle – CH_4	The Russian Federation reported in the NIR (section 5.3.2, p.151) the approach used for collecting data on fresh grass intake by cattle on pasture. The Party stated in the NIR that "statistical information at the national level include the number of total consumed feed units for the year of each kind of animal in farms of all types and is subdivided into concentrated feed, coarse feed, mixed fodder, fresh fodder and grazing feed. Additional statistical information on the consumption of fodder in pasture is also used, and therefore the consumption of certain types of feed by grazing animals has been defined as the difference between the data on total consumption of feed and the amount of fresh grass consumption in pastures known for different species of fodder". However, the ERT noted that there was no reference in the NIR regarding the origin of the additional source of statistical data on the	Yes. Transparency

ID#	Finding classification[1]	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem?[2] If yes, classify by type
		consumption of fodder in pasture. During the review, the Russian Federation informed the ERT that the information on fodder consumption is provided by Rosstat on its official website (http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/enterprise/economy/#).	
		The ERT recommends that the Party provide in the NIR the reference for the additional source of statistical data used in the inventory on the consumption of fodder in pasture.	
A.10	3.A.3 Swine – N_2O	The ERT noted that the value of crude protein (%) of fresh fodder consumed by swine, reported in NIR table 5.8 (p.172) (13.78 per cent) does not correspond to the average value of crude protein (%) for the same type of feedstuff presented in NIR table 3.1.2 (volume 2, annex 3.1, p.45) (11.49 per cent). During the review, the Russian Federation explained that the value presented in table 5.8 is correct and was used to evaluate the total crude protein (%) value of swine diet for the purpose of estimating emissions (and is the average crude protein content including fresh green fodder) and informed the ERT that the value in table 3.1.2 will be corrected in the next submission.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
		The ERT recommends that the Russian Federation correct the value of crude protein (%) of fresh fodder consumed by swine in NIR table 3.1.2 (annex 3.1) consistently with the information reported in table 5.8.	
A.11	3.A.4 Other livestock – CH_4	The Russian Federation reported in the NIR (p.159) the equation used to estimate the CH_4 EF for fur-bearing animals. The equation is expressed as a scaling of weight of fur-bearing animals to the average weight of swine. Data on the weight of fur-bearing animals are reported in the NIR; however, the data on swine weight used in the estimates and the CH_4 EF for swine used as a reference value in the equation were not presented. During the review, the Russian Federation explained that the data on swine weight used in the calculations is 56 kg/head (the weight for 2009, the year when the estimation of the EF for fur-bearing animals was estimated for the first time) and the CH_4 EF for swine enteric fermentation is 1.5 kg CH_4/head/year.	Yes. Transparency
		The ERT recommends that the Russian Federation include the data on swine weight (56 kg/head) and the CH_4 EF for swine (1.5 kg CH_4/head/year) to support the assumptions used in the equation to estimate the CH_4 EF for fur-bearing animals in the NIR (p.159).	
A.12	3.A.4 Other livestock – 3.B.4 Other livestock – 3.D Direct and indirect N_2O emissions from agricultural soils – CH_4 and N_2O	The Russian Federation did not report CH_4 and N_2O emissions for buffaloes under categories 3.A.4 (enteric fermentation) and 3.B.4 (manure management). However, the ERT noted that the FAO data contain the head population of buffaloes for the period 1992–2014 for the Russian Federation. In response, the Party explained that the data will be checked with the Russian statistical office (Rosstat) and, if existing buffaloes are confirmed, the corresponding emission estimates will be included in the next submission.	Yes. Completeness
		The ERT recommends that the Russian Federation clarify whether the population of buffaloes exists in the country. If it does, the ERT recommends that the Party estimate CH_4 and N_2O emissions under categories 3.A.4 (enteric fermentation) and 3.B.4 (manure management) and 3.D (direct and indirect N_2O emissions from agricultural soils).	
A.13	3.B Manure management – 3.D Direct and	The ERT noted that the average crude protein (%) values for the main types of feedstuff fed to dairy and non-dairy cattle (coarse feed, concentrates, mixed fodder) presented in NIR table 5.8 do not correspond to those presented in the NIR (volume 2, annex 3.1, p.32, table 3.1.1). For example, in NIR table 5.8, the crude protein values for coarse feed, concentrates and mixed fodder are 13.83,	Yes. Accuracy

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem[a] If yes, classify by type
	indirect N_2O emissions from agricultural soils – N_2O	11.61 and 23.57 per cent, respectively, while in table 3.1.1 these values are 11.61, 23.57 and 49.22 per cent, respectively. In response, the Russian Federation acknowledged the inconsistencies and informed the ERT that the data in table 3.1.1 are correct and that the incorrect values of crude protein (%) for the main feedstuff types in table 5.8 were used to calculate the overall value of the crude protein (%) for dairy and non-dairy diets. The ERT recommends that the Russian Federation recalculate the crude protein (%) for dairy and non-dairy cattle diets and apply this value to recalculate N_2O emissions from dairy and non-dairy cattle under categories 3.B (manure management) and 3.D (direct and indirect N_2O emissions from agricultural soils). The ERT also recommends that the Party correct the values of crude protein (%) in NIR table 5.8 consistently with table 3.1.1 (NIR volume 2, annex 3.1).	
A.14	3.C Rice cultivation – 3.D.a.4 Crop residues CH_4 and N_2O	The ERT noted that the Russian Federation has not provided references for some parameters used in the inventory: for example, for the average periods for rice cultivation by main types of rice (p.181) and for the N content (0.45 per cent) in bedding (straw) applied in animal housing (p.177). During the review, the Party explained that the average periods of cultivation for different types of rice were obtained by analysing available information on the web page of the Ministry of Agriculture and Processing Industry of Krasnodarsky krai (http://www.dsh.krasnodar.ru/activities/), as well as information on the national agrarian portal (http://www.agrostrana.ru/wiki/400-ris) and the agroindustrial portal of south Russia (http://www.agroyug.ru/page/item/_id-538/). For the estimation of N input, the Party noted that the reference is provided on page 185 of the NIR under category 3.D.a.4 (crop residues), and states that for cereals, the value is 0.45 per cent (Levin, 1977). The ERT recommends that the Party provide in the NIR the references for the average periods for rice cultivation by main types of rice and for the N content (0.45 per cent) in bedding (straw) applied in animal housing and that, when an assumption and a reference are reported under different chapters in the NIR, the Party cross-reference them or provide the correct reference where the assumption is reported.	Yes. Transparency
LULUCF			
L.6	Land representation	The ERT identified some inconsistencies between NIR tables 6.4 (land transition between 1990 and 2016, p.219) and 6.5 (land transition between 2015 and 2016, p.220) and CRF table 4.1 regarding AD for managed and unmanaged land: in NIR table 6.4 the initial managed forest area for 1990 is 609,607 kha while in CRF table 4.1 it is 609,514 kha; in NIR table 6.5, the net changes in areas of managed and unmanaged forest land are reported consistently with the areas reported in CRF table 4.1, although the initial and final areas substantially differ; for example, the final area of managed forest for 2015 is reported as 687,401.2 kha (NIR table 6.5) and 685,123.96 kha (CRF table 4.1). Similarly, the final area of unmanaged forest is reported as 209,611 kha (in NIR table 6.5) and 211,888.24 kha (CRF table 4.1). In response to the provisional main findings, the Party explained that the AD values in NIR tables 6.4 and 6.5 were not intended to show the same information as in the CRF table 4.1, and that these tables are consistent with CRF table 4.1, but aggregated in a different way. The Russian Federation considers that, according to the reporting requirements, Parties may provide any additional information in the NIR which in the view of the Party is relevant. The Party further explained that the difference seen in NIR table 6.4 is because forest area in that table for 1990 (609,607 kha) includes the area of forest land remaining forest land (609,470 kha),	Yes. Transparency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem[20] If yes, classify by type
		the area of deforestation (43 kha) and afforestation (93 kha); related to NIR table 6.5, the difference is because it includes the area of lands converted to unmanaged forest land (which is not included in CRF table 4.1). The ERT is of the view that providing information on AD on land areas in the NIR is essential for understanding the changes and trends in the LULUCF sector and that consistent reporting between NIR tables 6.4 and 6.5 and CRF table 4.1 considerably improves the transparency of the reporting and facilitates the review of the information. This does not prevent the Party from providing and documenting any other specific disaggregation/aggregation of land-use categories provided that the final areas of land-use categories are consistent between the NIR and the CRF table. The ERT recommends that the Russian Federation improve the transparency of the reporting by providing the final areas of land-use categories consistently between NIR tables 6.4 and 6.5 and CRF table 4.1.	
L.7	Land representation	The ERT noted that the total forest area (for 2015) reported in CRF tables 4.1 and 4.A does not fully match (897.01 and 896.73 million ha, respectively). The same applies for grassland (122.76 and 128.20 million ha, respectively), wetlands (226.83 and 225.46 million ha, respectively), settlements (14.14 and 11.03 million ha) and other land (360.00 and 358.62 million ha, respectively). As a result, the total area of the country obtained by adding together the land-use areas of the individual land-use categories in CRF tables 4.A to 4.F does not match the total land area reported in CRF table 4.1. The ERT further noted that these inconsistencies can be noted for most of the years of the reporting period. During the review, the Party acknowledge the inconsistencies and explained that for forest land (CRF table 4.A) the correct area is 896.73 million ha (as in CRF table 4.1). For grassland (CRF table 4.C) the inconsistency is because under grassland remaining grassland (category 4.C.1) it includes the area of unmanaged grassland (category 4.C.1.b) and areas of lands converted to unmanaged grassland (category 4.C.2.2.b). For wetlands (CRF table 4.D), the areas for wetlands remaining wetlands (category 4.D.1) and land converted to other wetlands (category 4.D.2.3) are correct. However, in 2015, owing to a survey to update forest area in the YamaloNenets district (see NIR p.218), the classification of areas has changed and 1 372.9 kha was no longer classified as forest land, but as a wetland. For settlements and other lands (CRF table 4.E and 4.F) the inconsistency is because in CRF tables 4.E and 4.F the annual area conversions are reported. The Party further explained that in CRF table 4.1 all areas are correct. The ERT believes that future ERTs should consider this issue further to ensure that there is not an underestimate of emissions, noting that adjustments cannot be applied to the Russian Federation's submission. The ERT welcomes the explanation provided by the Party and recommends that the Russian Federation correct CRF tables 4.A–4.F to reflect the correct area conversions in accordance with CRF table 4.1 for all years in the time series. The ERT also recommends that the Party verify whether emission estimates are accurate considering the different areas reported between CRF table 4.1 and CRF tables 4.A–4.F and report on the results in the next NIR.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
L.8	4.C.2 Land converted to grassland	The ERT noted that there are some inconsistencies in the reporting of the information provided by the Party for category 4.C.2 (land converted to grassland). For example, the text in the NIR (p.303) under section 6.4.3.2 (on land converted to grassland), including sections 6.4.3.2.1.5 and 6.4.3.2.2 and table 6.65 (p.315) related to areas of other lands converted to grassland and corresponding carbon stocks and stock changes were not updated since the previous submission and therefore there are inconsistencies with the information reported in CRF table 4.C. During the review the Party informed the ERT that the information	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem[b]? If yes, classify by type
		in CRF table 4.C is correct and it will update the NIR in the next submission. The ERT recommends that the Russian Federation update the NIR, section 6.4.3.2 (on land converted to grassland), including sections 6.4.3.2.1.5 and 6.4.3.2.2 and table 6.65 related to areas of other lands converted to grassland (and corresponding carbon stocks and stock changes), in order to ensure the coherence of the information with CRF table 4.C.	
Waste			
W.3	5. General (waste)	The Russian Federation reported in NIR tables 7.6 (p.381) and 7.14 (p.395) and in CRF table 5.D the population data used in the estimates of emissions in the waste sector. The Party made reference to two sources of data: in NIR table 7.6 (population to calculate the amount of municipal solid waste for category 5.A) it referred to Rosstat data and in NIR table 7.14 (source data for the consumption of protein for N_2O emissions for category 5.D) to FAO and Rosstat data. The ERT noted some inconsistencies in the figures presented in those tables. In addition, it was not clear to the ERT why different population data were used for both categories (5.A and 5.D) because the CRF table 5.D (additional information) presents the population data from FAO. During the review, the Russian Federation informed the ERT that the inconsistencies observed in the values between NIR tables 7.6 and 7.14 for the data provided by Rosstat are due to data rounding and that data from Rosstat were used for the calculation of emissions from categories 5.A and 5.D. The Party further explained that the population data from FAO reported in NIR table 7.14 is not correct and will be corrected in the next submission. The FAO data reported in CRF table 5.D (additional information) are correct and were used for "per capita protein consumption". However, the ERT noted that the footnote to NIR table 7.14 states that FAO data for protein consumption were used for 1990–1992, 2014 and 2015 only, while the NIR (section 7.5.2.2, p.394) states that FAO data were used for the period 1992–2013 to estimate emissions of N_2O. The ERT is of the view that the population data reported in the CRF 5.D (additional information) should be that used for the calculation of emissions (i.e. Rosstat data). The ERT recommends that the Russian Federation report in CRF table 5.D (under additional information) the population data used in the estimates of emissions for category 5.D (i.e. Rosstat data) and clarify in the NIR which population data (FAO or Rosstat) are used to calculate "per capita protein consumption" and for which years, and report the per capita protein consumption accordingly in CRF table 5.D. In addition, the ERT recommends that the Party correct the population data between NIR tables 7.6 and 7.14 to make them consistent.	Yes. Transparency
W.4	5.A Solid waste disposal on land – CH_4	During the review, the ERT asked the Party to provide the spreadsheets containing the calculations used to apply the first-order decay waste model. Upon evaluation, the ERT identified the following discrepancy between the calculations performed in the spreadsheet compared with CRF table 5.A and the NIR: (1) the amount (kt) of "annual waste at the SWDS" for 2013 for category 5.A.1 (managed waste disposal sites); (2) CH_4 emissions for category 5.A.1 (managed waste disposal sites) for 2014 and 2015; (3) DOC (x) for 2008 and 2012 (NIR table 7.3); (4) the amount (kt) of "annual waste at the SWDS" for 2008, 2013 and 2015 for category 5.A.2 (unmanaged waste disposal sites); and (5) CH_4 emissions for category 5.A.2 (unmanaged waste disposal sites) for the period 2009–2015. During the review, the Russian Federation acknowledged the inconsistencies in CRF table 5.A and in the NIR compared with the spreadsheet and explained that the data in CRF table 5.A and in the NIR will be corrected in the next annual inventory submission. The ERT believes that future ERTs should consider this issue further to ensure that there is not an underestimate of emissions, noting that adjustments cannot be applied to the Russian Federation's submission. The ERT recommends that the Russian Federation update CRF table 5.A with the correct data on the amount (kt) of "annual waste	Yes. Accuracy

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem[20] If yes, classify by type
		at the SWDS" for categories 5.A.1 (for 2013) and 5.A.2 (for 2008, 2013 and 2015) and the correct value of DOC (x) (for 2008 and 2012) in the NIR and recalculate CH_4 emissions accordingly.	
W.5	5.A Solid waste disposal on land – CH_4	The Russian Federation reported in the NIR (section 7.2.2, p.378) that the DOCf used in the emission estimates is 0.55 in accordance with the 2006 IPCC Guidelines. However, the ERT noted that the default value in the 2006 IPCC Guidelines (volume 5, chapter 3, p.3.13) is 0.50 (under the assumption that the SWDS environment is anaerobic and the DOC values include lignin). During the review, the Russian Federation explained that the value applied is incorrect and will be corrected in the next inventory submission.	Yes. Accuracy
		The ERT recommends that the Russian Federation use the default value (0.50) for DOCf and recalculate the CH_4 emissions from solid waste disposal on land for the entire time series.	
W.6	5.A.1 Managed waste disposal sites – CH_4	The Russian Federation reported in the NIR (section 7.2.2, p.379) that CH_4 recovery in the country exists only at landfills and on a very limited scale and that, in view of the insignificant amount of CH_4 recovered, it is not taken into account in the CH_4 emission estimates. However, the ERT noted that the Party used the notation key "NO" instead of "NE" in CRF table 5.A. The ERT is of the view that the Party should have reported the notation key "NE". During the review, the Russian Federation explained that for some years of the reporting period there was no CH_4 recovery at Russian landfills. CH_4 recovery occurred in the mid-1990s in the Moscow Region at one landfill, and from 2013 to present in the Krasnodar Region of the Russian Federation. The Party further explained that, taking into account the total number of landfills in the Russian Federation, the recovery is considered to be negligible and below the threshold of significance.	Yes. Comparability
		The ERT agrees that for the years where no CH_4 recovery occurs the notation key "NO" should be used and recommends that the Party increase the transparency of the information and clarify in the NIR when and in which regions CH_4 recovery occurs. For the years in which CH_4 recovery occurs, the ERT recommends that the Party use the notation key "NE".	
W.7	5.B.1 Composting – CH_4 and N_2O	The ERT noted that, in CRF table 5.B, the values of the CH_4 and N_2O IEFs from category 5.B.1 (composting) are different for 2015: for the period 1990–2014 the IEFs are 8 gCH_4/kg and 0.6 gN_2O/kg, while for 2015 these values are 7.83 gCH_4/kg and 0.487 gN_2O/kg. During the review, the Russian Federation acknowledged the differences and explained that this was due to an error in the calculations and that it will revise and correct such errors in the next submission. The ERT believes that future ERTs should consider this issue further to ensure that there is not an underestimate of emissions, noting that adjustments cannot be applied to the Russian Federation's submission.	Yes. Accuracy
		The ERT recommends that the Russian Federation evaluate the differences observed in the CH_4 and N_2O IEFs used for the period 1990–2014 and 2015, apply the correct value in the emission estimates, as appropriate, and ensure the consistency of the time series.	
W.8	5.D.1 Domestic wastewater – CH_4	The ERT noted that the same value is reported in CRF table 5.D for "amount of CH_4 flared" and "amount of CH_4 for energy recovery" for the entire reporting period: for example, for 2015 the value of 350.83 kt is reported for "amount of CH_4 flared" and for "amount of CH_4 for energy recovery". However, the Party does not provide in the NIR any explanation on how the amount of CH_4 flared and used for energy recovered is calculated.	Yes. Transparency
		During the review the Russian Federation provided an Excel spreadsheet with the calculations and explained that the collection and	

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem[a] If yes, classify by type
		combustion of CH_4 from wastewater treatment systems is carried out only in anaerobic digesters for sludge (CH_4 tanks) at centralized aerobic wastewater treatment plants. According to Russian engineering recommendations, such equipment is installed in cities with a population of more than 100,000 people. The Party explained that it is assumed in calculations that all residents of such cities use centralized sewage systems equipped with CH_4 tanks and all organically degradable pollutants in wastewater formed by the population are treated in such systems. Industrial wastewater is not taken into account. All CH_4 emissions in these systems are considered in the calculations as originating from the digesters. The Party further explained that the calculation of CH_4 emissions included the total number of inhabitants of cities with a population over 100,000 people, country-specific per capita biological oxygen demand (with a correction for wastewater from public services) and EF for digesters. The biogas from CH_4 tanks can be used for energy recovery (combustion) or it can be emitted to the atmosphere (i.e. venting). Calculation of the combusted gas mass is made according to the reference data, where the proportion of CH_4 tanks equipped with biogas combustion systems is taken as 0.5; the share of their operating time without combustion (i.e. emissions are vented to the atmosphere) is taken as 0.01. In addition, the Russian Federation provided confirmation that all combusted CH_4 from CH_4 tanks (all CH_4 recovered) in the Russian Federation is used for energy recovery (heat production). The Russian Federation explained that flaring of CH_4 does not occur and the quantities reported in CRF table 5.D for CH_4 flared are the quantities of CH_4 used for energy recovery. The ERT is of the view that the notation key "NO" should be reported for CH_4 flaring in CRF table 5.D because this activity does not occur within the country. The ERT recommends that the Russian Federation use the notation key "NO" for the reporting of CH_4 flaring in CRF table 5.D and provide an explanation in the NIR that combustion of CH_4 in flares does not occur. In addition, the ERT recommends that the Party include a more detailed description in the NIR on how the amount of CH_4 combusted for energy recovered is calculated.	
KP-LULUCF			
KL.9	Deforestation – CO_2	Noting the recommendation in ID# KL.4 in table 3, the ERT identified further issues to be addressed in CRF table 4(KP-I)A.2 under "Information items". Specifically: (1) the "total area for activity (kha)" (cell C21) should be the same as reported in "total for activity A.2" (cell C11), that is, the total accumulated area (605.12 kha in 2015); and (2) the other land-use categories (cell C23 to C27) should include the area related to destination land-use categories after deforestation (currently reported by the Party as "NO") which, together with the area reported for "forest land" (cell C22), that is, area subject to past deforestation events (see ID# KL.4 in table 3), will give as its sum the total accumulated area under deforestation. The ERT recommends that the Russian Federation provide in CRF table 4(KP-I)A.2 under "Information items" the correct AD. Specifically: for "total for activity" (cell C21), the total accumulated area as reported for "total activity A.2" (cell C11); and considering that under "forest land" (cell C22) should be reported area subject to past deforestation events (see ID# KL.4 in table 3), provide under other land-use categories (cell C23 to C27) the area related to destination land-use categories after deforestation.	Yes. Transparency

[a] Recommendations made by the ERT during the review are related to issues as defined in paragraph 81 of the UNFCCC review guidelines, or problems as defined in paragraph 69 of the Article 8 review guidelines. Encouragements are made to the Party to address all findings not related to such issues or problems.

VI. Application of adjustments

9. The Russian Federation does not have a quantified emission limitation or reduction commitment in the second commitment period of the Kyoto Protocol and therefore the application of adjustments does not apply.

VII. Accounting quantities for activities under Article 3, paragraph 3, and, if any, activities under Article 3, paragraph 4, of the Kyoto Protocol

10. The Russian Federation does not have a quantified emission limitation or reduction commitment in the second commitment period of the Kyoto Protocol and does not account for KP-LULUCF activities.

VIII. Questions of implementation

11. No questions of implementation were identified by the ERT during the review.

Annex I

Overview of greenhouse gas emissions and removals for the Russian Federation for submission year 2017 and data and information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as submitted by the Russian Federation

1. Tables 6–9 provide an overview of total GHG emissions and removals as submitted by the Russian Federation.

Table 6
Total greenhouse gas emissions for the Russian Federation, 1990–2015
(kt CO_2 eq)

	Total GHG emissions excluding indirect CO_2 emissions		*Total GHG emissions including indirect CO_2 emissions*[a]		*Land-use change (Article 3.7 bis as contained in the Doha Amendment)*[b]	*KP-LULUCF activities (Article 3.3 of the Kyoto Protocol)*[c]	*KP-LULUCF activities (Article 3.4 of the Kyoto Protocol)*	
	Total including LULUCF	*Total excluding LULUCF*	*Total including LULUCF*	*Total excluding LULUCF*			*CM, GM, RV, WDR*[d]	*FM*
FMRL								–116 300.00
1990	3 930 042.87	3 767 791.97	NA	NA	NA		NA	
1995	2 353 582.62	2 428 861.70	NA	NA				
2000	1 920 866.57	2 273 165.94	NA	NA				
2010	2 020 883.50	2 601 179.78	NA	NA				
2011	2 061 427.84	2 663 993.78	NA	NA				
2012	2 139 214.97	2 699 651.88	NA	NA				
2013	2 086 017.70	2 640 843.69	NA	NA		281.83	NA	–511 272.95
2014	2 076 025.05	2 645 819.28	NA	NA		934.58	NA	–501 393.74
2015	2 132 230.73	2 651 212.00	NA	NA		–179.06	NA	–504 208.31

Note: Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.

[a] The Party has not reported indirect CO_2 emissions in CRF table 6.

[b] The value reported in this column refers to 1990.

[c] Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely AR and deforestation.

[d] In accordance with decision 3/CMP.11, paragraph 8, the Russian Federation previously reported that it will not report on any activities under Article 3, paragraph 4, of the Kyoto Protocol.

Table 7
Greenhouse gas emissions by gas for the Russian Federation, excluding land use, land-use change and forestry, 1990–2015
(kt CO_2 eq)

	CO_2[a]	CH_4	N_2O	HFCs	PFCs	*Unspecified mix of HFCs and PFCs*	SF_6	NF_3
1990	2 589 895.60	942 070.69	183 377.52	35 937.16	15 122.41	NO	1 388.58	NO
1995	1 629 601.69	654 444.95	115 269.99	15 447.32	13 456.59	NO	641.15	NO
2000	1 504 292.53	632 746.07	98 744.21	26 569.68	9 894.72	NO	918.74	NO
2010	1 663 337.98	824 938.67	94 889.69	13 393.87	3 633.21	NO	986.36	NO
2011	1 718 110.85	840 119.13	90 355.58	11 274.71	3 317.94	NO	815.57	NO
2012	1 728 504.64	850 028.40	94 620.47	17 606.41	3 327.86	NO	5 564.11	NO
2013	1 667 851.04	853 762.09	89 132.28	21 441.95	3 419.50	NO	5 236.83	NO
2014	1 671 083.02	856 297.06	90 105.15	24 064.48	3 097.90	NO	1 171.68	NO
2015	1 670 809.45	864 061.96	90 439.91	21 166.24	3 586.42	NO	1 148.01	NO
Per cent change 1990–2015	**–35.5**	**–8.3**	**–50.7**	**–41.1**	**–76.3**	**NA**	**–17.3**	**NA**

Note: Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.
[a] The Russian Federation did not report indirect CO_2 emissions in CRF table 6.

Table 8
Greenhouse gas emissions by sector for the Russian Federation, 1990–2015
(kt CO_2 eq)

	Energy	*IPPU*	*Agriculture*	*LULUCF*	*Waste*	*Other*
1990	3 077 197.95	298 475.12	315 383.17	162 250.90	76 735.72	
1995	1 964 469.92	181 457.52	205 761.76	–75 279.07	77 172.49	
2000	1 843 713.05	197 355.53	152 668.27	–352 299.36	79 429.08	
2010	2 164 455.93	203 968.17	136 718.90	–580 296.29	96 036.78	
2011	2 226 905.19	207 039.41	130 853.40	–602 565.94	99 195.77	
2012	2 246 254.51	214 270.97	136 780.64	–560 436.91	102 345.76	
2013	2 189 079.77	214 690.55	131 318.52	–554 825.99	105 754.85	
2014	2 189 869.89	214 068.46	132 545.14	–569 794.23	109 335.79	
2015	2 194 466.93	209 980.55	132 127.64	–518 981.26	114 636.88	
Per cent change 1990–2015	**–28.7**	**–29.6**	**–58.1**	**–419.9**	**49.4**	

Notes: (1) Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions. (2) The Russian Federation did not report indirect CO_2 emissions in CRF table 6. (3) The Party does not report emissions for the category other in the CRF tables.

Table 9
Greenhouse gas emissions/removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol by activity, 1990[a]–2015, for the Russian Federation
(kt CO_2 eq)

	Article 3.7 bis as contained in the Doha Amendment[b]	*Article 3.3 of the Kyoto Protocol*		*FM and elected Article 3.4 activities of the Kyoto Protocol*				
	Land-use change	*AR*	*Deforestation*	*FM*	*CM*	*GM*	*RV*	*WDR*
FMRL				–116 300.00				
Technical correction				6 624.31				
1990	NA				NA	NA	NA	NA
2013		–5 038.51	5 320.34	–511 272.95	NA	NA	NA	NA
2014		–4 970.01	5 904.59	–501 393.74	NA	NA	NA	NA
2015		–4 888.51	4 709.45	–504 208.31	NA	NA	NA	NA
Per cent change 1990–2015					**NA**	**NA**	**NA**	**NA**

Note: Values in this table include emissions on lands subject to natural disturbances, if applicable.

[a] The Russian Federation has selected not to report on any activities under Article 3, paragraph 4, of the Kyoto Protocol. For activities under Article 3, paragraph 3, of the Kyoto Protocol, and FM under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] The value reported in this column refers to 1990.

2. Table 10 provides an overview of relevant key data for the Russian Federation's reporting under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

Table 10
Key relevant data for the Russian Federation under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

Key parameters	*Values*
Periodicity of accounting	NA
Election of activities under Article 3, paragraph 4	None
Election of application of provisions for natural disturbances	No
3.5% of total base-year GHG emissions, excluding LULUCF	NA
Cancellation of AAUs, ERUs, CERs and/or issuance of RMUs in the national registry for:	
1. AR in 2015	NA
2. Deforestation in 2015	NA
3. FM in 2015	NA
4. CM in 2015	NA
5. GM in 2015	NA
6. RV in 2015	NA
7. WDR in 2015	NA

Annex II

Additional information to support findings in table 2

Missing categories that may affect completeness

The categories for which methods are included in the 2006 IPCC Guidelines that were reported as "NE" or for which the ERT otherwise determined that there may be an issue with the completeness of reporting in the Party's inventory are the following:

(a) PFC emissions (other than CF_4, C_3F_8 and c-C_4F_8) from category 2.E (electronics industry) (see ID# I.8 in table 3);

(b) CO_2 emissions from selective catalytic reduction converters (see ID# I.15 in table 5);

(c) CH_4 and N_2O emissions from buffaloes under categories 3.A.4 (enteric fermentation), 3.B.4 (manure management) and 3.D (direct and indirect N_2O emissions from agricultural soils) (see ID# A.12 in table 5);

(d) CO_2, CH_4 and N_2O emissions from open burning of waste in category 5.C.2 (see ID# W.2 in table 3);

(e) CO_2 emissions from organic soils on deforested areas (see ID# KL.5 in table 3).

Annex III

Documents and information used during the review

A. Reference documents

IPCC reports

IPCC. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. S Eggleston, L Buendia, K Miwa et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at http://www.ipcc-nggip.iges.or.jp/public/2006gl.

IPCC. 2014. *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*. T Hiraishi, T Krug, K Tanabe et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at http://www.ipcc-nggip.iges.or.jp/public/kpsg.

IPCC. 2014. *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*. T Hiraishi, T Krug, K Tanabe et al. (eds.). Geneva: IPCC. Available at http://www.ipcc-nggip.iges.or.jp/public/wetlands/.

Annual review reports

Reports on the individual review of the 2013, 2014 and 2015 annual submissions of Russian Federation, respectively, contained in documents FCCC/ARR/2013/RUS, FCCC/ARR/2014/RUS and FCCC/ARR/2015/RUS.

Other

Aggregate information on greenhouse gas emissions by sources and removals by sinks for Parties included in Annex I to the Convention. Note by the secretariat. Available at http://unfccc.int/resource/webdocs/agi/2017.pdf.

Annual status report for the Russian Federation for 2017. Available at http://unfccc.int/resource/docs/2017/asr/rus.pdf.

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B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Alexander Nakhutin (Institute of Global Climate and Ecology), including additional material on the methodology and assumptions used.